

**Amendments to the Claims:**

The listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

Claims 1.-15. (Cancelled)

Claim 16. (New) A periodic electromagnetic structure comprising an array of conducting LC elements in combination with a frequency-dependent dielectric whose permittivity and/or permeability varies according to the frequency of radiation incident thereon such that the resonant frequency of the LC elements follows the frequency of the incident radiation.

Claim 17. (New) The structure of Claim 16, wherein the frequency-dependent dielectric has a response to incident radiation such that the product of the permittivity and permeability of the dielectric varies in proportion to the reciprocal of the square of the frequency of the incident radiation.

Claim 18. (New) The structure of Claim 16, wherein the frequency-dependent dielectric has a response to incident radiation such that the permittivity of the dielectric generally varies in proportion to the reciprocal of

the square of the frequency of the incident radiation and the permeability of the dielectric is substantially constant.

Claim 17. (New) The structure of Claim 16, wherein the frequency-dependent dielectric has a response to incident radiation such that the permeability of the dielectric generally varies in proportion to the reciprocal of the square of the frequency of the incident radiation and the permittivity of the dielectric is substantially constant.

Claim 18. (New) The structure of Claim 17, wherein the frequency-dependent dielectric is ferrite material type 4EI.

Claim 19. (New) The structure of Claim 16, wherein the LC elements are protrusions from a flat conducting plate.

Claim 20. (New) The structure of Claim 19, wherein the frequency-dependent dielectric abuts the conducting plate and the protrusions extend at least partially into the dielectric.

Claim 21. (New) The structure of Claim 20, wherein the protrusions are generally thumb tack shaped.

Claim 22. (New) The structure of Claim 17, wherein the structure forms an ultra compact photonic bandgap device.

Claim 23. (New) The structure of Claim 17, wherein the structure forms a split ring resonator.

Claim 24. (New) The structure of Claim 21, wherein the LC elements are disposed across the surface of the frequency-dependent dielectric.

Claim 25. (New) The structure of Claim 17, wherein the structure comprises chiral conductors).

Claim 26. (New) The structure of Claim 25, wherein the chiral conductors are helical.

Claim 27. (New) The structure of Claim 25, wherein the chiral conductors are set within the frequency dependent dielectric.

Claim 28. (New) The structure of Claim 16, wherein the structure forms a high-impedance surface.

Claim 29. (New) The structure of Claim 28, wherein the surface impedance of the periodic electromagnetic structure is substantially  $377 \Omega$ .

Claim 30. (New) An antenna comprising a periodic electromagnetic structure according to Claim 16.

Claim 31. (New) A mobile phone handset comprising an antenna according to Claim 30..

Claim 32. (New) A radar absorbent material comprising a periodic electromagnetic structure according to Claim 16, wherein the impedance of the structure is substantially  $377 \Omega$ , thereby to match the impedance of free space.